

We Claim:

1. An apparatus for sending or receiving radiation, comprising:
a housing having a top portion and a base, said top portion including walls defining an opening with an open top and a closed bottom;
a conductor accommodated within said housing, said conductor having two electrically isolated portions, a first portion having a first end terminating in an electrode external to said housing and a second end having a first open area exposed along said closed bottom such that said first portion is substantially surrounded by said housing but for said open area, and a second portion having a third end terminating in an electrode external to said housing and a fourth end having a second open area exposed along said closed bottom such that said second portion is substantially surrounded by said housing but for said second open area;
a semiconductor chip bonded to said first open area such that said semiconductor chip is positioned within said opening and said first open area is limited in area by said housing to substantially only accommodating said semiconductor chip;
a wire having a first end bonded to said semiconductor chip and a second end bonded to said second open area such that said wire is positioned within said opening and said second open area is limited by said housing to substantially only accommodate said wire bond; and
a window formed within said opening such that a top of said window is coplanar with a top of said housing.
2. The apparatus according to claim 1, wherein said first and second open area is the only part of said first and second conductor portions that is exposed within said cavity.
3. The apparatus according to claim 1, wherein said first and second conductor portions are coplanar.

4. The apparatus according to claim 1, wherein said first and second conductor portions are in a first plane and said first and second open area are in a second plane.
5. The apparatus according to claim 1, wherein said housing is made of a reflective material wherein at least said closed bottom is reflective of said radiation.
6. The apparatus according to claim 5, wherein said reflective material includes a diffuse reflective degree of at least 80%.
7. The apparatus according to claim 1, wherein said electrodes wrap around a portion of said base.
8. An apparatus for sending and receiving radiation, comprising:
a housing having a top portion and a base, said top portion including walls defining an opening with an open top and a closed bottom;
a conductor accommodated within said housing, said conductor having two electrically isolated portions, a first portion having a first end terminating in an electrode external to said housing and a second end having a first open area exposed along said closed bottom such that said first portion is substantially surrounded by said housing but for said open area, and a second portion having a third end terminating in an electrode external to said housing and a fourth end having a second open area exposed along said closed bottom such that said second portion is substantially surrounded by said housing but for said second open area;
a semiconductor chip bonded to said first open area such that said semiconductor chip is positioned within said opening and said first open area is limited in area by said housing to substantially only accommodating said semiconductor chip;

a wire having a first end bonded to said semiconductor chip and a second end bonded to said second open area such that said wire is positioned within said opening and said second open area is limited by said housing to substantially only accommodate said wire bond; and

a window formed within said opening such that a top of said window is coplanar with a top of said housing.

9. The apparatus according to claim 8, wherein said first and second open area is the only part of said first and second conductor portions that is exposed within said cavity.

10. The apparatus according to claim 8, wherein said first and second conductor portions are coplanar.

11. The apparatus according to claim 8, wherein said first and second conductor portions are in a first plane and said first and second open area are in a second plane.

12. The apparatus according to claim 8, wherein said housing is made of a reflective material wherein at least said closed bottom is reflective of said radiation.

13. The apparatus according to claim 12, wherein said reflective material includes a diffuse reflective degree of at least 80%.

14. The apparatus according to claim 8, wherein said electrodes wrap around a portion of said base.

15. A method of forming a housing for a semiconductor chip, said method comprising the steps of:

preparing a lead frame having multiple portions, a first portion having a first open area and said second portion having a second open area;

bonding a semiconductor to said first open area;

bonding a first end of a wire to said semiconductor and a second end of said wire to said second open area;

injection molding a housing about said first and second portions such that said first and second open areas are exposed in an opening and the rest of the first and second portions are covered by said housing; and

forming a transparent window in said opening.

16. The method according to claim 15, wherein said first and second open area is the only part of said first and second portions that is exposed within said opening; and a bottom of said opening is reflective.

17. The method according to claim 16, wherein the step of spraying a housing further comprises the step of maintaining said first portion and first opening and second portion and second opening coplanar within said housing.

18. The method according to claim 16, wherein the step of injection molding a housing further comprises the step of maintaining said first portion and second portion in a first planar within said housing and forming said first open area and second open area in a second plane.

19. The method according to claim 15, further including the step of coating said opening with a reflective material.

20. The method according to claim 19, further including the step of wrapping ends of said lead frame about a base of said housing such that said ends form external conductors; and wherein said reflective material has a diffuse reflective degree of at least 80%.